

## **Effects of Long-term exposure to microgravity conditions on bacterial communities.**

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Bacteria exposed to the spaceflight environment have been proven to show profound phenotypic changes, including increase resistance to antibiotics, increased bacterial community formation and increased resistance to environmental stresses, just to mention a few. To more fully characterize the space-flight induced conditions, we have performed a long-term experiment consisting in monitoring growth of multiple bacterial species (*Escherichia coli*, *Lactococcus lactis* and *Staphylococcus salivarius*) using a 2D clinostat design that simulates microgravity conditions. All bacterial species were grown in microcosms under gravity and microgravity in an effort to simulate microbiome communities. Bacteria were collected and tested for competition studies and for multiple cell phenotypes, including cell morphology, susceptibility to chemical and physical stressors and virulence-related phenotypes such as biofilm formation and antibiotic susceptibility. Possible interactions between cells grown in the artificial microbiome will help us to understand alterations of human bacterial communities during space travel.

**Keywords:** Simulated microgravity, bacterial communities, biofilm formation, antibiotic susceptibility, space environment